

EJSCREEN: Environmental Justice Screening and Mapping Tool

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What is EJSCREEN?

EJSCREEN is an environmental justice mapping and screening tool that provides EPA with a nationally consistent dataset and approach for combining environmental and demographic indicators. EJSCREEN users choose a geographic area; the tool then provides demographic and environmental information for that area. All of the EJSCREEN indicators are publicly-available data. EJSCREEN simply provides a way to display this information and includes a method for combining environmental and demographic indicators into EJ indexes.

EJSCREEN includes:

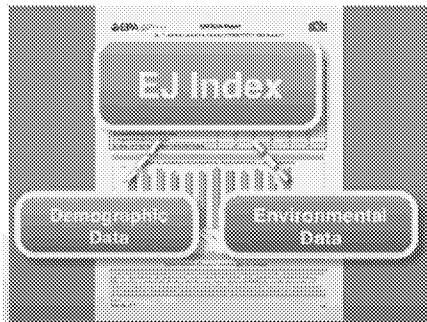
- 12 environmental indicators
- 6 demographic indicators
- 13 EJ indexes

EJSCREEN Overview



<https://www.epa.gov/eiscreen/what-eiscreen>

EJ Indexes



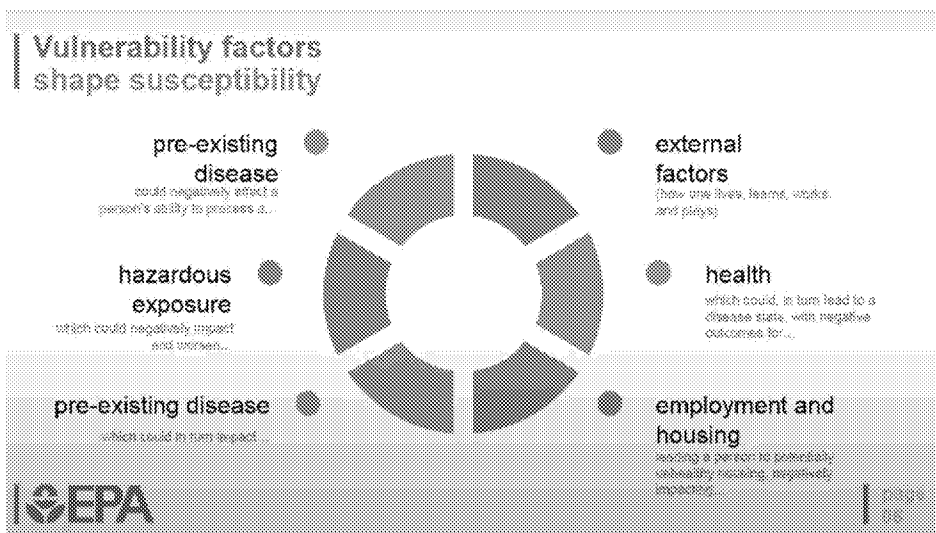
EJ indexes combine **environmental** and **demographic** data to highlight areas where vulnerable/susceptible populations may be disproportionately impacted by pollution.



[Click here to watch a 5 minute video on how the EJ Indexes are constructed.](#)



From video EJScreen Overview



From video EIScreen Overview

Ex. 5 Deliberative Process (DP)

Region 8 Regional Implementation Plan

The EPA Region 8 office developed the EPA Region 8 Regional Implementation Plan to Promote Meaningful Engagement of Overburdened Communities in Permitting Activities (Region 8 Regional Implementation Plan) which identifies internal recommended procedures for the EPA Region 8 to follow while acting on permit applications. The EPA Region 8's general process for prioritizing permit applications for enhanced public participation is as follows:

1. Conduct a preliminary screen to assess if the area around the facility contains a potentially overburdened community;
2. Determine if the type of permit action has the potential for significant public health or environmental impacts; then
3. Based on the first two steps and any other relevant information available, decide whether enhanced public participation is warranted.

End Result: During our 2017 public comment period on the first draft permits and AE ROD, R8 conducted enhanced outreach opportunities for the Edgemont community and for the nearest Sioux Tribes:

- Public comment period was initially 74 days and was extended to 105 days (as opposed to the required minimum of 30 days).
- 5 public hearings in four locations
- Public outreach sessions at each of these public hearings

We made changes to the Class III and Class V Area Permit and AE ROD in response to 2017 comments, so we issued 2nd drafts in 2019. We didn't do enhanced outreach, but proactively scheduled a second public hearing. The original comment period was 45 days but was extended to 107 days.

Region 8 Regional Implementation Plan

- The Region 8 Regional Implementation Plan identifies certain permits that are considered a priority for enhanced participation due to the potential for significant public health or environmental impacts.
- Certain types of UIC permits have been identified as priority permits, including Class III permits for uranium recovery and deep injection wells with injection zones above a regional USDW.
- Although UIC permits for Class V injection wells are not specifically included as high priority permits in the EPA Region 8 Implementation Plan, EPA considers the Dewey-Burdock deep Class V injection wells to be a priority for enhanced participation due to the potential for significant public health or environmental impacts because the injection zone for the deep Class V wells is above the Madison aquifer, an important source of drinking water in western South Dakota.
- For this reason, the EPA has included more stringent Class I well construction and monitoring requirements in the Class V Area Permit.
- Thus, the EPA considers both the Dewey-Burdock Class III and Class V Area permits as appropriate for identifying these permit actions as priorities for enhanced outreach under the EPA Region 8 Regional Implementation Plan.

Ex. 5 AC/DP

2.1 Selection of Areas for Screening

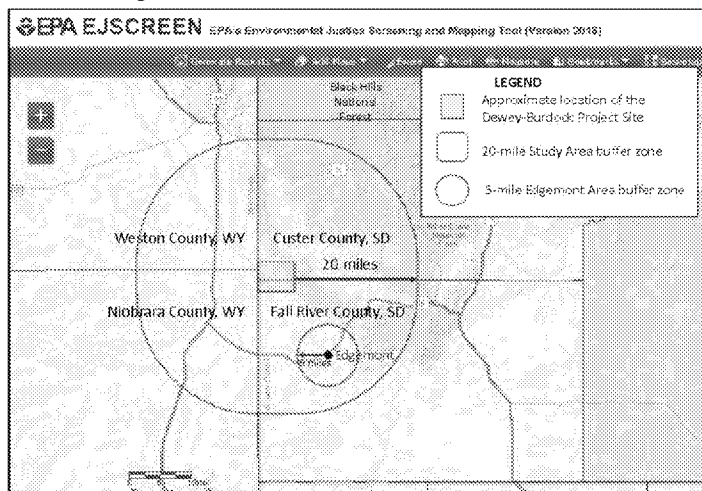


Figure 2. Location of the Study Area, which includes the Dewey-Burdock Project Area and a 20-mile buffer measured from the approximate Project Area Boundary, and the Edgemont Area, which includes a 5-mile buffer around the City of Edgemont.

How Region 8 selected the EJ Study Areas

We first selected a study area based on a 5-mile radius around the Area Permit boundary.

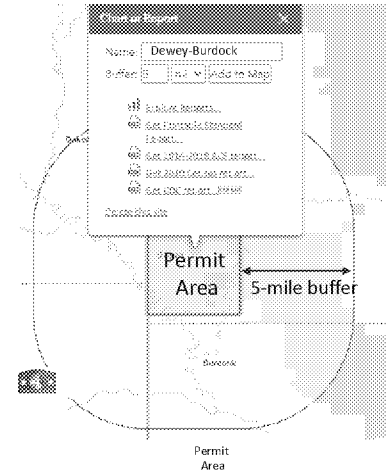
The population in the area is so sparse, the 5-mile radius included a population of only 87.

We did not think a report based on a population of only 87 was meaningful for our analysis.



EISCREEN Report (Version 2020)
 5 miles Ring around the Area
 SOUTH DAKOTA, EPA Region 8
 Approximate Population: 87
 Input Area (sq. miles): 171.98

Selected Variables	Value	State	
		Avg.	%ile
Demographic Indicators			
Demographic Index	12%	24%	65
People of Color Population	7%	10%	17
Low Income Population	27%	21%	47
Linguistically Isolated Population	0%	1%	68
Population with Less Than High School Education	18%	15%	40
Population under Age 5	0%	7%	21
Population over Age 64	31%	16%	96



How Region 8 selected the EJ Study Areas

Section 2.1 discusses the Selection of Areas for Screening

Consistent with UIC regulation 40 CFR § 144.33, the EPA also prepared a separate draft Cumulative Effects Analysis (CEA) to examine environmental impacts resulting from the drilling and operation of the injection wells authorized under the UIC area permits. The cumulative effects analysis includes consideration of potential impacts to various resources, including groundwater, surface water and air.

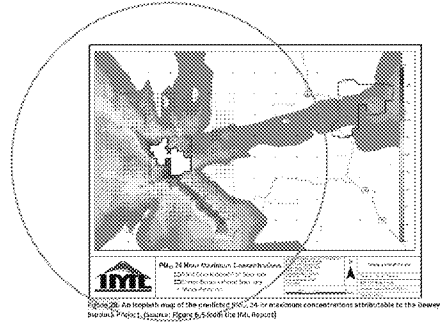
The EPA reviewed the results of predictive air modeling conducted at the site by the Inter-Mountain Laboratories, Inc., Air Science division (IML) on behalf of the permit applicant.

Although in general the modeling results predicted air impacts below National Ambient Air Quality Standards and concentrations below the Prevention of Serious Deterioration Class I and Class II increments, air modeling results predicted detectable impacts above background levels beyond the Dewey-Burdock Project Area Boundary (see, e.g., CEA Figure 28). These measurable impacts lie within the 20-mile buffer zone. R8 based the Study Area on this 20-mile buffer zone that includes measurable air impacts.

40 CFR § 144.33 Area permits.

(c) The area permit may authorize the permittee to construct and operate, convert, or plug and abandon wells within the permit area provided:

(3) The cumulative effects of drilling and operation of additional injection wells are considered by the Director during evaluation of the area permit application and are acceptable to the Director.

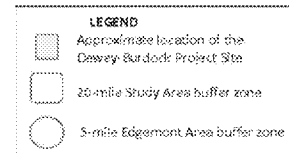
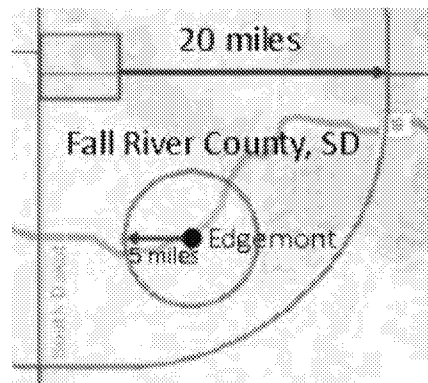


How Region 8 selected the EJ Study Areas

The Region 8 EJ Program recommended generating a second EJScreen report for a 5-mile buffer around the Town of Edgemont and evaluating that area separately.

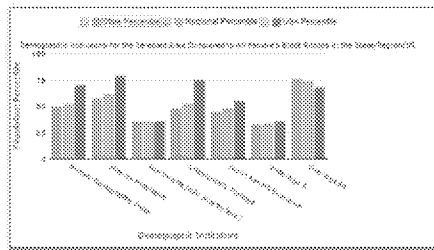
The rationale was to see if the larger Study Area might mask the EJ Indexes calculated for that community.

It turns out that was the case! So we conducted an additional EJ analysis for Edgemont.



Results are ranked as percentiles

- Percentiles put indicators into common units of 0 – 100.
- For example, a place at the 80th percentile nationwide means 20% of the US population has a higher value.
- Ranking values as percentiles allows comparison of indicators measured with different units. It does not mean the risks are equal or comparable.

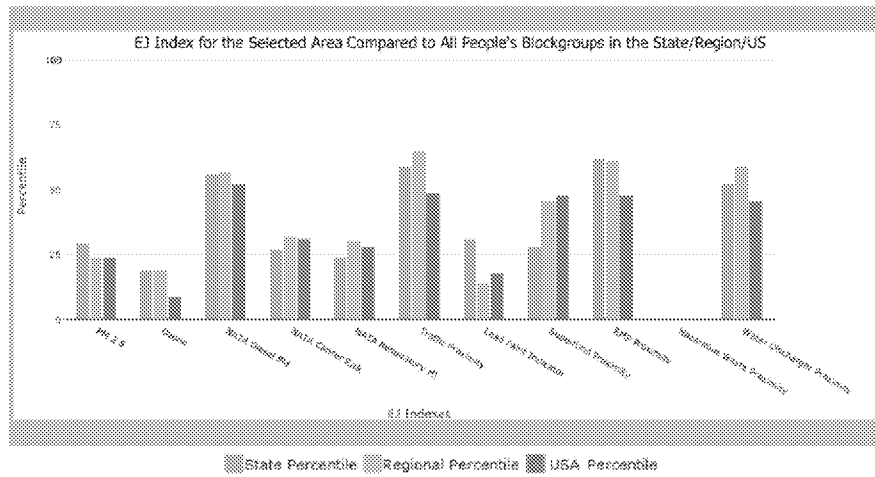


EPA

From video EJSscreen Overview

2.2 EJSCREEN Standard Reports

EJSCREEN produced standard reports showing the results from screening the Study Area and the Edgemont Area. The Study Area report is included in Appendix B of this document and the Edgemont Area report is included in Appendix C.



From the Study Area report

The R8 EJ Program advised the UIC Program to look more closely at indexes with State Percentiles ≥ 80 .

EJSCREEN results flagged the Edgemont Area for

- Superfund Proximity and
- Risk Management Plan (RMP) Proximity,

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	89	63	51
EJ Index for Ozone	64	81	45
EJ Index for NATA ¹ Diesel PM	71	66	55
EJ Index for NATA ¹ Air Toxics Cancer Risk	68	85	53
EJ Index for NATA ¹ Respiratory Hazard Index	63	83	53
EJ Index for Traffic Proximity and Volume	72	70	53
EJ Index for Lead Paint Indicator	44	22	24
EJ Index for Superfund Proximity	97	93	85
EJ Index for RMP Proximity	83	71	58
EJ Index for Hazardous Waste Proximity ¹	N/A	N/A	N/A
EJ Index for Water Discharger Proximity	67	66	54

Note: RMPs are facilities located in or near the area that handle a large enough volume of chemicals that the facility is required to have a Risk Management Plan to address potential chemical spills.

While these flags (Percentiles ≥ 80) do not necessarily indicate that there is a disproportionately high impact within the Study Area or the Edgemont Area from these EJ Index categories, they prompted the R8 UIC program to conduct further investigation of these topics.

The R8 UIC Program examined the **Environmental Indicators** for Superfund Proximity and the RMP Proximity more closely.

We determined that the actual number of Superfund sites in the Edgemont Area is zero.

Similarly, we determined that there are no RMP facilities in the area.

These numbers are comparable to the state average for these categories which is also a number less than one.

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators from Edgemont report							
Particulate Matter (PM 2.5 in $\mu\text{g}/\text{m}^3$)	6.16	7.89	9	7.17	20	9.32	2
Ozone (ppb)	53.5	50.3	99	54.8	25	47.4	82
NATA* Diesel PM ($\mu\text{g}/\text{m}^3$)	0.11	0.284	21	0.605	<50th	0.937	<50th
NATA* Cancer Risk (lifetime risk per million)	18	22	30	30	<50th	40	<50th
NATA* Respiratory Hazard Index	0.84	0.62	42	1.4	<50th	1.8	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	2.6	49	16	250	8	590	7
Lead Paint Indicator (% Pre-1960 Housing)	0.46	0.24	66	0.23	61	0.2	73
Superfund Proximity (site count/km distance)	0	0.016	78	0.11	36	0.13	16
RMP Proximity (facility count/km distance)	1.6E-05	0.29	9	0.34	4	0.43	1

The "math" to calculate percentiles was skewed by the low numbers for these areas in the State of South Dakota. The calculation is # of facilities/acres, That's how you end up with a number of facilities less than 1.

As discussed in Section 8.0 Potential Air Quality Impacts, we also saw that ozone concentration ranked in the 99th percentile the state. That is artificially high because of the low ozone concentrations across South Dakota. An increase of only 3.5 ppb in the Edgemont Area above the 50.3 ppb for the state resulted in the 99th percentile. The Air Quality Index Scale shows that an AQI of 50 or less is considered to be "good." The AQI Calculator converts a concentration of a pollutant to an AQI value, for example the ozone concentration of 53.5 ppb converts to an AQI of 49, which is in the "good" range.

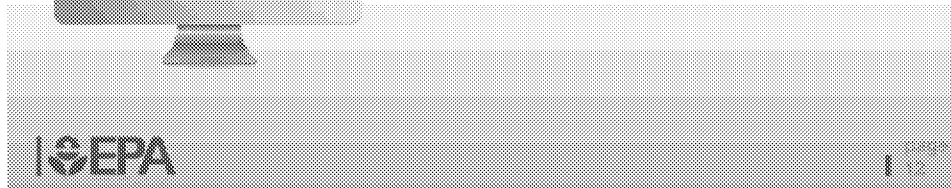
Demographic Indicators



Indicator: Demographic index

Date: 2010 - 2014

Definition: (Low income + minority) / 2



Primary indicator for vulnerability and susceptibility (see slide 3)
From video EJScreen Overview

Demographic Indicators from Edgemont Report

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Demographic Indicators							
Demographic Index	25%	25%	85	27%	56	36%	42
Minority Population	5%	16%	31	23%	14	37%	13
Low Income Population	46%	33%	75	31%	77	35%	70
Linguistically Isolated Population	0%	1%	69	2%	55	5%	44
Population With Less Than High School Education	13%	9%	75	9%	75	14%	58
Population Under 5 years of age	2%	7%	6	7%	10	6%	14
Population over 64 years of age	21%	15%	79	12%	86	14%	93

- It is EPA Region 8 policy to examine the Demographic Indicators, focusing on the *Minority Population* and *Low-Income Population* values.
- If either of these values is greater than the state average, the EPA conducts additional analysis to evaluate whether the impacts on the community are disproportionate by comparing the impacted community to a reference population or average (neighboring counties, state average or national average).
- Additional demographic indicators are considered on a case-by-case basis.

2.4 Demographic Indicator Results

The results for the Edgemont Area showed

- the *Low-Income Population* demographic indicator is above the state average (46% as compared to 33%),
- as are indicators for *Population with Less than a High School Education* (10% as compared to 9%) and
- *Population over 64 Years of Age* (24% as compared to 15%).

Conclusions

2.5 Consideration of Demographic Factors

According to EPA Region 8 practice, because the Edgemont Area has a *Low-Income Population* demographic indicator above the state average, the area is a candidate for additional analysis to gauge whether any other environmental impacts on the community are disproportionate.

R8's additional analysis of environmental impacts included...

3.0 Additional Analysis of Impacts

3.1 Cleanup Operations in the Study Area and the Edgemont Area

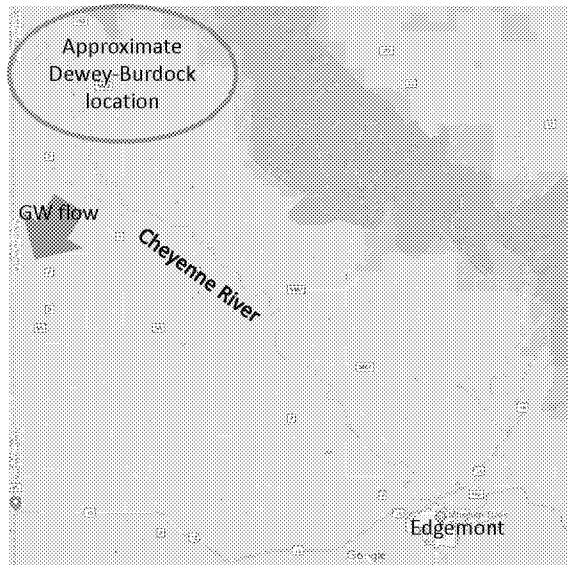
Table 1. Site Cleanups within the Study Area and the Edgemont Area, South Dakota

Cleanup Name	City	State	County Name
FORMER BLACK HILLS ARMY DEPOT	PROVO	SD	FALL RIVER
TVA SILVER KING MINERS INC.	EDGEMONT	SD	FALL RIVER

3.2 EPA Superfund Review of the Abandoned Uranium Mines located near the Dewey-Burdock Project Area

The Study Area contains abandoned uranium mines that are located within the Dewey-Burdock Project Area.

R8's additional analysis to evaluate whether the impacts on the community are disproportionate by comparing the impacted community to a reference population or average (neighboring counties, state average or national average) included a review of Community Health Status Indicators.



3.3 Community Health Status Indicators

- R8 examined *Community Health Status Indicators* (CHSI) for Fall River County for further information about the Edgemont community within the Study Area.
- Based on the direction of groundwater flow, surface water flow and prevailing wind direction, Fall River County will receive any down-gradient impacts from the Dewey-Burdock Project Area.
- The EPA conducted this analysis to identify how Edgemont and Fall River County ranked in comparison to peer communities and the U.S. average for the CHSI.

Environmental Justice Indexes in EJSCREEN

The EJ index is a combination of environmental and demographic information. There are eleven EJ Indexes in EJSCREEN reflecting the 11 environmental indicators.

The 11 EJ Index names are:

1. National Scale Air Toxics Assessment Air Toxics Cancer Risk
2. National Scale Air Toxics Assessment Respiratory Hazard Index
3. National Scale Air Toxics Assessment Diesel PM (DPM)
4. Particulate Matter (PM2.5)
5. Ozone
6. Lead Paint Indicator
7. Traffic Proximity and Volume
8. Proximity to Risk Management Plan Sites
9. Proximity to Treatment Storage and Disposal Facilities
10. Proximity to National Priorities List Sites
11. Wastewater Discharge Indicator